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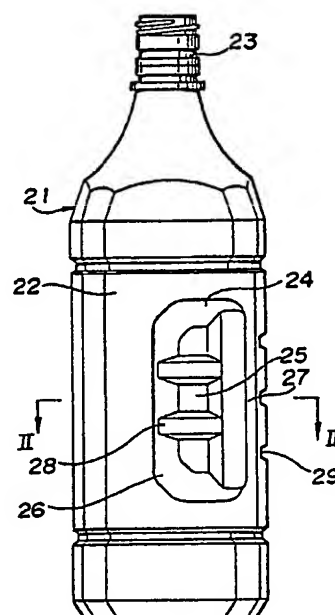
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54 Blaxial-orientation blow-moulded bottle-shaped container.

57 A blow-moulded bottle-shaped container (21) of biaxially-oriented synthetic resin having an integrally-moulded neck (23) at the top of a cylindrical body (22) of the container, there being a pair of inwardly-depressed recesses (24) in the cylindrical wall of the cylindrical body at opposite sides thereof with the minimum spacing between the recesses (24) being at their deepest parts (25) so that a portion of the cylindrical wall between the recesses (24) forms a grip (27) as a result of the recesses, wherein at least one laterally-extending reinforcing rib (28) projects concavely in an arch-shape bent inwards to cross both tapered walls (26) of each of the recesses.

FIG. 1.



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## Bi-axial-Orientation Blow-Moulded Bottle-Shaped Container

This invention relates to a blow-moulded bottle-shaped container of biaxially-oriented synthetic resin such as polyethylene terephthalate resin.

Recently, bottle-shaped containers of relatively large size for containing liquids such as, for example, liquors or soy sauces have been widely utilized.

The most effective means for moulding a bottle-shaped container of this type include means for moulding the bottle-shaped container by bi-axially orientation blow-moulding a preformed parison moulded from a synthetic resin material. Particularly, a blow-moulded bottle-shaped container of biaxially-oriented polyethylene terephthalate resin has a number of advantages such as a light weight, excellent mechanical strength and physical properties, an inexpensive cost together with the possibility of mass production.

Since the blow-moulded bottle-shaped container of biaxially-oriented synthetic resin of this type has a round configuration as a whole with a smooth surface and is moulded in a relatively large size, the bottle-shaped container tends to feasibly slip when held by a hand and is accordingly inconvenient to be grasped by the hand, and must be associated with a grip separately moulded as a holding means of the container body.

In order to obviate this difficulty of holding the conventional bottle-shaped container, axially slender recesses have been manufactured at both sides of a cylindrical body of the bottle-shaped container so as to utilize the rear halves of the container body as a grip.

The above-mentioned conventional bottle-shaped container is certainly convenient to handle but does not always have sufficient mechanical strength. More specifically, the conventional bottle-shaped container of this type exhibits serious drawback so that, when the conventional bottle-shaped container is dropped in the state that a predetermined quantity of liquid is filled in the container body to conduct a strength test, the slender recesses formed on the body of the bottle-shaped container are externally projected and deformed by the internal pressure of the liquid contained in the container body by the dropping impact, resulting in no recovery of the deformation.

Further, this external projecting deformation of the recesses on the body of the conventional bottle-shaped container means insufficient buckling strength of the recesses formed on the container body, whereas the bottle-shaped container is desired to provide high mechanical strength.

Accordingly, it is an object of this invention to provide a blow-moulded bottle-shaped container of

biaxially-oriented synthetic resin which can eliminate the drawbacks and inconvenience of the conventional bottle-shaped container described above and can enhance sufficiently the mechanical strength of the recesses formed on the container body by providing reinforcing ribs for effectively dispersing the internal pressure acting on the recesses.

The foregoing object and other objects as well as the characteristic features of the invention will become more fully apparent and more readily understandable by the following description and the appended claims when read in conjunction with the accompanying drawings, in which :

Figs. 1 and 2 show an embodiment of a bottle-shaped container according to the invention. A bottle-shaped container 21 has a cylindrical container body 22 in which the lateral cross-sectional shape thereof is formed substantially in a rectangular shape, and a neck 23 integrally moulded through a shoulder at the top of the container body 22.

Recesses 24 formed on opposite cylindrical surface portions of the container body 22 are respectively depressed inwardly toward a deepest body surface portion 25 at the centre thereof via inclined tapered walls 26 at the periphery thereof.

A pair of the recesses 24 are formed as described above on the opposite cylindrical surface portions to thereby cause the rear parts of the container body 22 to become a grip 27 of an axial strip shape. Further, a plurality of lateral grooves 29 are formed at a predetermined interval in parallel on the rear peripheral wall of the grip 27. The lateral grooves 29 thus formed provide mechanical strength of the grip 27, i.e., sufficient resistance strength against the grasping force of a hand acting on the grip 27 so as not to deform the grip 27.

Further, one or more reinforcing ribs 28 of projecting strip shape are respectively formed laterally in the recesses 24 to cross the recesses 24 in such a manner that the ribs 28 are projected from the peripheral walls 26 of the recesses 24.

In the embodiment described above, two reinforcing ribs 28 reinforce the recesses 24 having long elevational height. The number of the reinforcing ribs 28 in the recesses 24 may be selected depending upon the degree to be reinforced of the recesses 24. In the particular embodiment shown, two reinforcing ribs 28 are spaced at such an interval that a finger of the hand can be inserted, thereby performing the anti-slip effect by the reinforcing ribs 28.

It is noted that the projecting state of the reinforcing rib 28 may be any of linear and externally

swelling state and that both ends of the reinforcing ribs 28 may be disposed in the vicinity of the depression starting portion of the recesses 24 from the tapered wall 26 so as to increase the projecting height width as much as possible. However, even in case where the ribs 28 are externally swelled, it is to be noted that the position of the projecting end must not be a value such that it projects from the plane shape of the cylindrical body surface of the entire container body 22, i.e., a value larger than the depth of the recesses 24. Ideally, the projecting height width of the rib 28 may be preferably set to a value equal to or near the depressed depth width of the recesses 24.

According to the embodiment described above, the reinforcing ribs 28 are moulded to cross the recesses 24 in a projecting strip shape in a relatively high projecting width. Therefore, sufficiently high mechanical strength can be provided in the recesses 24. Thus, even if internal or external pressure is acted on the recesses 24, the recesses 24 are not externally transferred, bent, projected nor deformed by the internal pressure, and the recesses 24 may not be further depressed nor deformed by the external pressure.

Therefore, even if the bottle-shaped container constructed as described above is dropped in the state that a content liquid is filled to rise the impact internal pressure in the container body or to effect a large internal pressure on the recesses, or even if a strong external pressure is acted on the recesses when the grip is grasped by hand in the state that the content liquid is so filled as to be heavy, the reinforcing ribs resist against the internal and external pressure acting on the recesses. Therefore, the recesses of the bottle-shaped container are not bent, projected nor deformed towards the outside or inside, and the mechanical strength of the entire bottle-shaped container can be largely enhanced. Also, since the grip is integrally moulded with the container body, a relatively large-sized bottle-shaped container body can be readily handled.

#### Claims

1. A blow-moulded bottle-shaped container (21) of biaxially-oriented synthetic resin having an integrally-moulded neck (23) at the top of a cylindrical body (22) of the container, there being a pair of inwardly-depressed recesses (24) in the cylindrical wall of the cylindrical body at opposite sides thereof with the minimum spacing between the recesses (24) being at their deepest parts (25) so that a portion of the cylindrical wall between the recesses (24) forms a grip (27) as a result of the recesses, characterized in that at least one laterally-extending reinforcing rib (28) projects con-

cavely in an arch-shape bent inwards to cross both tapered walls (26) of each of the recesses.

2. A container according to claim 1, characterized in that the reinforcing ribs (28) are aligned at such a predetermined interval that a finger of a human hand can enter the interval.

3. A container according to claim 1, characterized in that a plurality of lateral grooves (29) are aligned across the grip (27) without extending into the recesses.

4. A container according to claim 1, characterized in that the reinforcing ribs project convexly in an arch shape bent outwards to cross both tapered walls (26) of each of the recesses.

5. A container according to claim 1, characterized in that the reinforcing ribs have a length substantially equal to a lateral length of the recesses and a height less than the depth of the recesses.

FIG. 1.

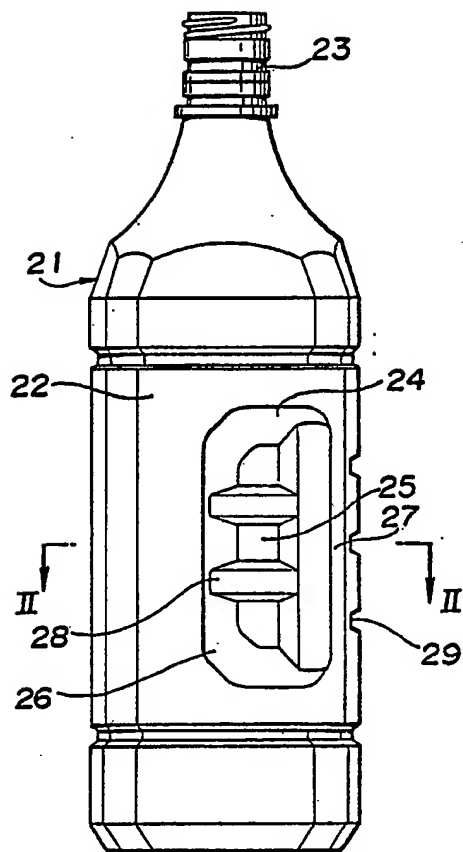
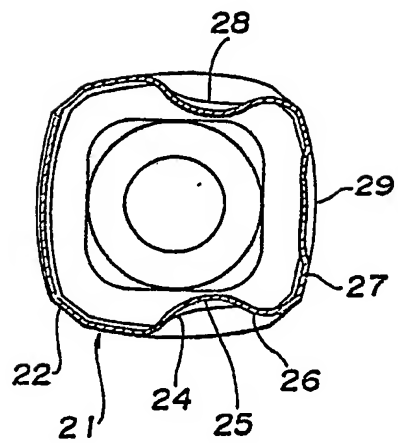


FIG. 2.





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. CL.4)
A	EP-A-0 033 745 (YOSHINO) * Page 2, line 18 - page 4, line 17; figures * ---	1	B 65 D 1/02 B 65 D 23/10
A	FR-A- 934 609 (CALVE-DELFT) * Page 1, lines 32-41; page 1, line 57 - page 2, line 6; figures * ---	1,2,5	
A	US-A-1 602 391 (CREAVER) * Page 1, lines 47-91; figures * ---	2,4,5	
A	US-A-2 022 520 (PHILBRICK) * Page 1, column 2, lines 4-26; figures * ---	3	
A	FR-A-1 337 902 (CLODREY) -----		
			TECHNICAL FIELDS SEARCHED (Int. CL.4)
			B 65 D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27-09-1989	Examiner KLEIN C.
<b>CATEGORY OF CITED DOCUMENTS</b>			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	